

Guidance for Hazardous Waste Remediation



May 2003 Training

Agenda

- I. Welcome, Logistics, and Agenda Overview
- II. Introduction and Background
- III. HW Determinations
- IV. Determining if Contaminated Media is HW
- V. Land Disposal Restrictions
- VI. Management Options
- VII. Determining Contained-out
Values for Contaminated Media
- VIII. Redevelopment Issues



II. Introduction and Background



Introduction

- Over the last several years, many questions were raised on the applicability of the HW rules to remediation projects.
- Management directed us to prepare a proposal for resolving the issues. Seek EPA concurrence on our recommended approach.
- Numerous discussions and meetings were held. EPA provided 7 letters to WDNR clarifying their position on HW remediation issues.

EPA Guidance Document

United States
Environmental Protection
Agency

Solid Waste and
Emergency Response
(3306W)

EPA/530-F-08-028
October 1998
www.epa.gov/osw

Management of Remediation Waste Under RCRA

- Excellent summary of applicable RCRA requirements to cleanup.
- Forms the basis for the development of our guidance.

Introduction (cont.)

- Numerous other EPA policy and guidance documents exist.
- WDNR's Guidance provides links to all of the relevant EPA documents as well as the letters to and from EPA.



Purpose of the Guidance

- Provide staff, RP's and others with the information necessary to determine if sites are contaminated with hazardous waste, and if so, the specific requirements that apply.
- To result in the best environmental outcome at the most reasonable costs while complying with the applicable HW requirements.

Background

- RCRA passed in 1976
- Subtitle C contained the requirements for HW generation and management.
- Detailed Federal rules became effective in November, 1980.
- Applicability of the rules to contaminated media was not considered until later.

Background (cont.)

- In 1986 EPA issued a memo stating that contaminated media must be managed as HW if it:
 1. "Contains" a listed hazardous waste,
or
 2. Exhibits a hazardous characteristic.
- This was referred to as the "contained-in" policy.

State Specific Information

- The RCRA Program was developed to be implemented by the States.
- WDNR is authorized to implement most cleanup portions of the Program including:
 1. Facility Closures,
 2. RCRA Corrective Action, and
 3. CAMU Rule.

Consolidated Cleanup Program

- WDNR initiated a consolidated cleanup program in the early 1990's.
- Resulted in promulgation of NR 700 series.
- Discussions took place with EPA on the applicability of NR 700 to RCRA cleanups.
- Initial feedback from EPA on 12/15/95.

Consolidated Cleanup Program (Cont.)

- EPA supported this approach if certain key HW requirements remained in-place.
- These included preserving our HW enforcement authority, maintaining permitting requirements and schedules.
- Subsequent guidance (May, 1997) gave most RP's the opportunity to follow the NR 700 process.

Consolidated Cleanup Program (Cont.)

- WDNR developed a standard RP letter for dealing with these types of cases.
- Enforcement action under NR 600 would be pursued if the RP does not voluntarily comply or the investigation and cleanup are not timely.
- This approach will continue to be used.

Consolidated Cleanup Program (Cont.)

- In 2001 EPA re-confirmed the use of NR 700 for RCRA cleanups including:
 1. Site Investigations,
 2. Evaluating and Selecting Remedies,
 3. Establishing Soil Cleanup Standards,
 4. Use of soil performance standards including engineering or institutional controls,
 5. Natural attenuation, and
 6. Site Closure.

III. Hazardous Waste Determinations



Hazardous Waste Determinations

- State and Federal rules require the generator of a solid waste to determine if the waste is a HW.
- There are 2 major ways contaminated media can be defined as HW:
 1. The media contains a listed HW,
or
 2. The media exhibits a hazardous characteristic.

Listed Hazardous Wastes

- NR 605.09 has a series of tables identifying waste streams that are hazardous.
- Non-specific sources - "F" Listed.
- Specific sources - "K" Listed.
- Chemical Products would be either "U" or "P" listed wastes if they were discarded or if someone intended to discard them.

Characteristic HW

- Ignitability
- Reactivity
- Corrosivity
- Toxicity

Mixture/Derived From Rules

- Waste or media mixed with a listed hazardous waste becomes a hazardous waste under the Mixture rule.
- Waste or media derived from the treatment of listed hazardous waste would require management as a hazardous waste.

HW Determinations (cont.)

- Waste determinations can be made by either:
 1. Testing the material using the procedures in ch. NR 605, or
 2. Applying knowledge.
- Testing is typically done to determine HW characteristics, while applying knowledge is usually done for evaluating if a waste is listed.

HW Determinations (cont.)

- Although no specific requirements exist regarding how to use the “apply knowledge” approach, EPA has provided guidance.
- As a result, decisions are typically made on a case-by-case basis.
- General guidance is provided in this document.

HW Determinations (cont.)

- Waste determinations should be made early in the process, normally at the Site Investigation stage.
- This is important because the regulatory status of the media and the selected remedial action can significantly affect the cost and timing of a project.

Good Faith Waste Determinations

- Generators need to make a good faith effort to determine the source of contamination.
- This may include evaluation of:
 1. Material Safety Data Sheets (MSDS's),
 2. Manifests, vouchers, and bills of lading,
 3. Sales and Inventory Records,
 4. Accident, spill, and inspection reports,
 5. Discussions/Interviews with former employees.

Waste Determinations (cont.)

- If after a good faith evaluation, the evidence on the source of the contamination is either unavailable or inconclusive, it should be assumed the media is not a listed HW.
- Staff should use their knowledge of the site and any readily available information when asked to review waste determinations.

Review of HW Determinations

- Usually performed only when requested.
- Requests need to include all supporting information as well as the \$500 review fee. (See waste determination checklist).
- Discussions between WA & RR is encouraged.
- If agreement can't be reached, the final decision is the responsibility of RR.

Example No. 1

Background

- Vacant shopping center with PCE found in both soil and groundwater.
- The proposed developer evaluates potential sources including a former dry cleaner, but a specific source is not found.
- Without a documented source, they can conclude the media doesn't contain listed HW.

Example No. 1 (cont.)

- If a source area is found adjacent to the former dry cleaner or if documentation exists on the cause of the release, then the media may be a HW. It depends on:
 1. When the release occurred,
 2. Product spill vs. waste release, and
 3. Selected option for management of the contaminated media.

Example No. 2

- Former paint manufacturing facility.
- A prospective purchaser does a Phase I/II.
- The investigation discovers BETX compounds at various locations.
- The Phase I reveals that benzene was a major ingredient in paint manufacturing.

Example No. 2 (cont.)

- Numerous petroleum tanks also present at the property.
- A review of the available records indicate that releases took place during the 60's and 70's at both locations.
- A subsequent investigation could not determine where the existing contamination originated.

Example No. 2 (cont.)

- Since the source of contamination was inconclusive the prospective purchaser concludes the media does not contain listed HW.
- If information revealed the contamination was only due to releases from the product benzene tanks, then the media may be HW.

IV. Determining if Contaminated Media is HW



HW Flow Chart



HW Determinations

STEP 1 - Is the media contaminated with a material meeting the definition of a “listed” hazardous waste, or commercial chemical product?

- If the answer is no (or if you don’t know) go to Step 1a.

HW Determinations (cont.)

STEP 1a – Is the contamination from the release of a characteristic hazardous waste?

- If the answer is no (or if you don't know) go to Step 1b.

HW Determinations (cont.)

Step 1b. - Is the planned remedy an in-situ or ex-situ option?

- If an in-situ remedy is proposed, then the media would not be considered HW.
- If the remedy is ex-situ, then the RP/Waste Generator would need to determine if the media exhibits a HW characteristic now.

HW Determinations (cont.)

- If the media now exhibits a HW characteristic, it would require management as a hazardous waste.
- If the media does not exhibit a hazardous characteristic, then management as a solid waste is appropriate.

HW Determinations (cont.)

- If the answer under Step 1a was yes (media was contaminated by a characteristic HW) go to Step 1c.
- Does the media still exhibit a hazardous characteristic in-situ?
- If no, the media can be managed as a SW. If yes, then manage as HW.
- Example

Example

- A Company discovers foundry waste fill in an area of a proposed plant expansion.
- Material does not meet the definition of a listed HW
- Disposal took place in the 1970's, and therefore the material would not have been a characteristic HW at the time of disposal.

Example (cont.)

- Since the volume of waste is relatively small, the Company chooses to excavate the material and ship it off site for management.
- If the waste does not exhibit a HW characteristic at the time of excavation then it can be managed as a solid waste.
- If it does exhibit a HW characteristic, then it would require management as a HW.

HW Determinations (cont.)

Step 2 - If the answer under Step 1 was yes (the media was contaminated by material meeting the definition of a listed HW or commercial chemical product), then determine if the waste or product was “listed” at the time of release.

- A good faith effort is required.
- If the answer is no (or if you don’t know) go to Step 2a.

HW Determinations (cont.)

Step 2a. - Is the planned remedy an in-situ or ex-situ option?

- If in-situ, then the media is not a HW.
- If ex-situ, evaluate whether a “contained-out” determination can be made.

“Contained-out” Determinations

- Media contaminated with listed HW that is treated to meet site specific, health based, direct contact numbers could be determined to no longer “contain” a HW.
- If the media does not exhibit a HW characteristic, then it would no longer be defined as a HW.
- This is called a “contained-out” determination.
- Example

Example

- A developer determines that contamination at a former manufacturing facility is due to release of spent TCE that would meet the F001 listing.
- Release occurred prior to 1980.
- Installation/operation of an SVE system is not HW treatment because the media is not HW in-situ.

Example (cont.)

- If an ex-situ remedy is planned, evaluate whether a contained-out determination can be made.
- If yes, the media can be managed as a solid waste.
- If no, then ex-situ management results in the media being defined as hazardous waste.

HW Determinations (cont.)

- If the answer under Step 2 is yes (the waste or product was listed at the time of the release) go to Step 3.

Step 3 - Was the release from a commercial chemical?

- If the answer is yes (or if you don't know) go to step 3a.

HW Determinations (cont.)

Step 3a - Is the planned remedy an in-situ or ex-situ option?

- If an in-situ remedy is planned, the media is not a HW.
- If an ex-situ remedy is planned, evaluate whether a “contained-out” determination can be made (Step 3b).

HW Determinations (cont.)

- If a “contained-out” determination can not be made, then ex-situ management results in the media being defined as a HW.
- If the answer under Step 3 was no (the released material was not a commercial chemical product) this means the released material was a listed HW.

HW Determinations (cont.)

- **Step 4** - Even though the release was from a listed HW, it may still be possible to make a “contained-out” determination.
- If a contained-out determination can be made, the media can be managed as a SW.
- Otherwise, the media needs to be managed as a HW regardless of whether an in-situ or ex-situ option is chosen.

HW Determinations (cont.)

- A “contained-out” determination could be made after the release of a listed HW if:
 1. The material is only hazardous because of ignitability,
 2. An immediate removal takes out the high level concentrations. Remaining concentrations are below health based values.
 3. In place biodegradation has reduced the levels to below direct contact health based values.

Break



V. Land Disposal Restrictions (LDR's)



Land Disposal Restrictions (LDR's)

- LDR's were established to prohibit the land disposal of HW unless specified treatment standards are met.
- LDR's are either concentration based or technology based.
- The goal is to substantially reduce the toxicity/mobility before land disposal.

LDR's (cont.)

- In 1998, EPA promulgated the Phase IV LDR rule which set treatments standards for contaminated soil.
- This rule requires treatment that either:
 1. Achieves a 90% reduction in concentration,
 - or
 2. Meets a concentration of 10 times the Universal Treatment Standards (UTS).

Specific Soil LDR's

<u>Contaminant</u>	<u>10x UTS Concentration</u>
Benzene	100 mg/kg
Toluene	100 mg/kg
TCE	60 mg/kg
PCE	60 mg/kg
Vinyl Chloride	60 mg/kg
Cadmium	1.1 mg/l TCLP
Chromium	6.0 mg/l TCLP
Lead	7.5 mg/l TCLP

LDR's (cont.)

- UTS values have been incorporated in NR 600, and the Phase IV rules are being included in the current revisions to NR 600.
- The 90% reduction or 10 times UTS standard is allowed by the HW remediation guidance and should be used now.

Applicability of LDR's to Soil

- LDR's typically do not apply to soil in-situ or force excavation of contaminated soil.
- If contaminated soil is not removed from the land (i.e. generated) LDR's generally don't apply.

Applicability of LDR's to Soil

- Once a decision is made to excavate and re-dispose of the soil, LDR's may apply.
- Generally LDR's only apply to soil that contains a hazardous waste.
- Once the LDR's have attached the treatment standard must be met, unless a treatability variance is approved.

LDR Treatability Variances

- EPA recently promulgated a new process for approving LDR treatability variances for contaminated soil.
- This allows EPA and States to approve treatability variances (i.e. an alternate treatment standard) if short and long-term threats are minimized.

Treatability Variances (cont.)

- This is appropriate when:
 1. A risk based determination supercedes the established standard, or
 2. It is not technically feasible to meet the established standard.
- WDNR is in the process of incorporating the new rules into the NR 600 series. Until then, use our state HW variance process.

LDR Example No. 1

- Soil is contaminated with TCE which was released prior to 1980.
- Since the release was prior to 1980 the in-place soil is not HW, nor do the LDR's apply in-situ.

Example No. 1 (cont.)

- If the TCE concentrations do not exceed the TCLP standard (0.5 mg/l) and are below an approved direct contact HBN, then a “contained-out” determination can be made.
- Since the soil is not HW upon excavation, the LDR’s do not apply.

LDR Example No. 2

- Release of spent PCE took place in the early to mid 1980’s.
- This was after the HW rules became effective, but prior to promulgation of the LDR standards.
- Soil has concentrations above direct contact HBN’s, and would likely fail TCLP as well.

Example No. 2 (cont.)

- If the soil were treated in-situ to below the direct contact HBN’s and the applicable TCLP value, a “contained-out” determination could be made.
- Upon excavation the soils would be SW.
- LDR’s would not apply since the release was prior to PCE standards being established and the soil was not HW when generated.

Example No. 2 (cont.)

- If the soil were excavated prior to treatment, it would be an F002 listed HW.
- LDR's would attach at the time of excavation (i.e. generation).
- Soils would need to either be:
 1. Managed as HW, or
 2. Treated to meet direct contact HBN's and LDR's.

LDR Example No. 3

- A generator removes soil contaminated with a spill of product benzene.
- The soil, when excavated, would be a U019 listed HW.
- The excavated soil must be treated to meet the LDR standard for benzene.

Example No. 3 (cont.)

- If the soil is treated to meet direct contact HBN's and the appropriate LDR's, a contained out decision could be made.
- This would allow the soil to be managed as a solid waste.

VI. Management Options



Management Options for Media Defined as Hazardous

- In general, the treatment, storage or disposal of media requires a HW license, variance or an exemption from the rules.
- In the early 1990's WDNR determined that issuing a HW operating license for cleanup projects was not practical.
- Numerous other alternatives are available.

Management Options (cont.)

- Exemptions by Rule:
 1. Wastewater treatment units,
 2. Publicly Owned Treatment Works (POTW's),
 3. ReInjection of contaminated groundwater, or
 4. Treatment in waste accumulation tanks or containers.

Wastewater Treatment Units

- Generally applies to wastewater treatment units that treat waste from on-site.
- Off-site waste can be management provided certain notification, recordkeeping and reporting requirements are met.
- Typically used for on-site treatment of contaminated groundwater.

Publicly Owned Treatment Works (POTW's)

- Applies to groundwater defined as HW.
- To be eligible the POTW must:
 1. Have a WPDES permit,
 2. Comply with the conditions of the permit,
 3. Comply with certain notification and reporting requirements, and
 4. Meet pre-treatment requirements.

Reinjection of Contaminated Groundwater

- Federal rules allow reinjection if:
 1. The injection is part of a response action,
 2. The contaminated groundwater is treated to substantially reduce the concentrations,
 3. Upon completion, the response action will be protective.

Reinjection of Contaminated Groundwater (cont.)

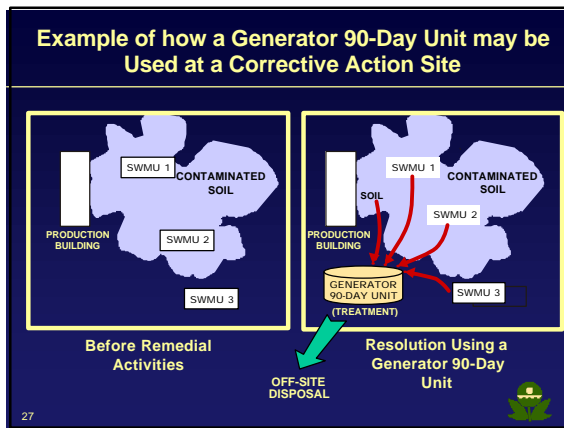
- NR 600 is being revised to be consistent with the Federal provisions.
- The rule revisions should become effective sometime in 2003.
- Until then, this option may be utilized provided the draft rule language is followed.

Treatment in Accumulation Tanks and Containers

- NR 630.04(18) provides an exemption from licensing for generators that treat HW (including media) in containers and tanks.
- Need to follow the appropriate technical standards.
- Example

Example

- Company discovers soil contaminated with lead that would fail TCLP.
- They estimate the volume to be approximately 30 cubic yards.
- They decide to treat the soil in roll-off containers with lime.
- A HW license or variance is not necessary if the container standards are met.



Hazardous Waste Variances

- State statutes allow DNR to issue a variance from the requirement to obtain a license if its determined it would cause “undue or unreasonable hardship” for any person.
- A variance may not result in undue harm to public health or the environment.
- Duration can not exceed 5 years.

HW Variances

- EPA issued guidance on the use of permit waiver authority in 1987.
- States could use their permit waiver authority, provided it was done no less stringent than EPA.
- A note was added to NR 680.50 in 1991 that indicates variances are intended to promote cleanup of HW contamination.

HW Variances

- Remediation variances would typically meet the hardship criteria.
- Meeting the undue/unreasonable hardship criteria does not mean the proposal is technically sound....only that the activity is eligible for a variance.
- Applicants should use the appropriate provisions in NR 700 when preparing the application.

HW Variances

- Review of remediation variances is the responsibility of RR, with assistance from WA.
- Applications must be accompanied by the appropriate review fee set out in NR 680.45
- Proposed variances must be sent to EPA for review. Allow 2 weeks for their comments.

HW Variances

- EPA has required that cleanup variances include a public participation component.
- DNR developed a 3-Tier approach.
Tier 1 - Variance done in conjunction with a formal plan modification.
Tier 2 - Notice and 30 day comment period.
Tier 3 - Follow the NR 700 Process

HW Variances

- The Tier 2 Process:
 1. We request the RP issue a Class I public notice.
 2. 30 day public comment period.
 3. The notice must describe the details of the proposed project.
 4. DNR responds to comments and makes the final decision.

HW Variances

- Most variance approvals or conditional approvals should utilize a letter format.
- If deemed necessary by the Project Manager or Team Supervisor a FOF/COL format could be used.
- Draft version should be sent to the applicant for review and comment.

Area of Contamination (AOC) Policy

- The AOC policy interprets RCRA to allow certain areas of generally dispersed contamination to be considered RCRA units.
- Since AOC's are considered land based units, consolidation or in-situ treatment does not result in a new point of HW generation.

AOC Policy (cont.)

- Allows wastes to be consolidated or treated in-situ within the AOC without triggering:
 1. Land Disposal Restrictions (LDR's), and
 2. Minimum Technology Requirements (MTRs).
- Ex-situ treatment or off-site disposal is not covered by the AOC policy

AOC Policy (cont.)

- The AOC policy typically works best for situations where the contaminants are a direct contact concern.
- EPA approved our request to allow project managers to use their judgment on a site-specific basis when designating an AOC.
- Examples

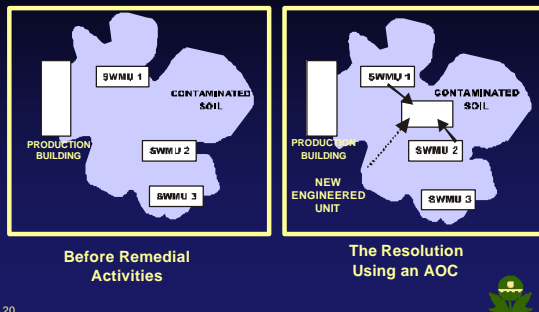
AOC Example

- A developer performs a Phase I/II on a potential property.
- Evaluation indicates that the property was used for foundry waste disposal from the 60's until the early 1980's.
- Concentrations of lead may be high enough to exceed TCLP levels.

AOC example (cont.)

- The large volume makes removal impractical.
- Developer wishes to consolidate the waste within the footprint of the new building.
- Since the waste is “generally dispersed” across the property, an AOC can designated.
- Consolidation would not be considered to be “generation”. TCLP testing not needed.

Example of how an AOC may be used at a Corrective Action Site



Corrective Action Management Units (CAMU's)

- Rule originally promulgated in 1993.
- WDNR adopted the rule and received authorization in 1999.
- Revisions to the CAMU rule were promulgated by EPA in January, 2002

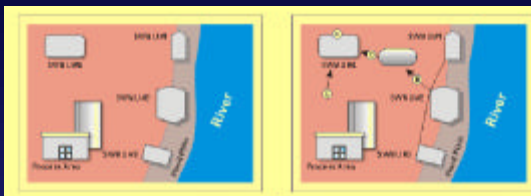
CAMU's

- The rule allowed remediation waste to be treated or disposed of within a CAMU without triggering LDR's and MTR's.
- The revised rule now specifies certain minimum design and treatment standards be met, unless specifically waived by DNR.
- DNR has a 3-year interim authorization.

CAMU's

- If treatment will be the desired management approach, probably better to use a HW variance than a CAMU.
- If final disposal of hazardous remediation waste is needed, the best option is typically designation of a CAMU.
- Example

Example of how a CAMU may be Used at a Corrective Action Site



Before Remedial Activities

The Resolution Using CAMUs



Review

- When treating, storing, or disposing of hazardous remediation waste you generally need a unit (AOC, CAMU, e.g.) and an approval (permit, permit waiver, order, e.g.)
- LDRs can be tailored. LDR treatment variances can be approved without rulemaking
- You generally have many options, try to work backwards from your desired remedial action to find the RCRA compliance approach that best supports your cleanup

40



Management Options Flow Chart



Break



VII. Determining “Contained-out” Values for Contaminated Media



Soil Containing Listed HW

- Soil containing listed HW remains hazardous until:
 1. The NR 720 table values are met
 - or
 2. Calculated site specific, direct contact RCL's values are met.
- If appropriate, meet LDR's.

Site Specific Soil RCL's

- Calculating site specific soil RCL's should use the following assumptions:
 1. Follow the provisions in s. NR 720.19(5),
 2. Calculate RCL's using industrial assumptions,
 3. Don't need to determine cumulative excess cancer risk or cumulative hazard index values for disposal in a SW landfill,
 4. Should not exceed Csat values.

Example Soil RCL's

<u>Contaminant</u>	<u>Direct Contact RCL's</u>
TCE	14 ppm
PCE	33 ppm
Vinyl Chloride	.87 ppm

Groundwater RCL's

- Groundwater contaminated with a listed HW would be hazardous until the NR 140 Enforcement Standard (ES) was met.
- In most cases, contaminated groundwater could be managed in an on-site treatment unit or discharged to the sanitary sewer and be exempt from most HW requirements.

Media with a HW Characteristic

- Media that exhibit a hazardous characteristic remain a HW until the characteristic is removed.
- In the majority of cases, this would be media that fails TCLP.
- May still need to comply with LDR standards.

Example TCLP Values

<u>Contaminant</u>	<u>Regulatory Limits (mg/l)</u>
Benzene	0.5
TCE	0.5
PCE	0.7
VC	0.2
Lead	5.0
Chromium	5.0

Tips

- Not all remediation waste is hazardous
- Good decisions about remedy selection should drive cleanups. When thinking about hazardous remediation waste management options work backwards from desired result.

42



Tips (Cont.)

- These are site-specific choices that will be influenced by:
 - Regulatory and policy factors
 - Owner/operator concerns and preferences
 - Community concerns and preferences
- Consider “radical” options/approaches if you need to support timely implementation of good remedies

43



VIII. Redevelopment Issues



Redevelopment Issues

- The Land Recycling law provides certain exemptions to local governments (LGU's) and lenders on liability protection.
- Typically applies in situations where the LGU or lender did not cause the contamination.
- Similar type exemptions are found in the CERCLA and LUST programs.

Redevelopment Issues (cont.)

- Unfortunately, there are no federal liability exemptions under the HW regulations.
- Wanted to encourage LGU's and lenders to help with the cleanup and redevelopment of these sites.
- Worked with EPA to develop a 48-month pilot program.

Redevelopment Issues (cont.)

- The pilot program allows WDNR to use enforcement discretion in not applying the RCRA corrective action provisions.
- The existing exemption criteria in ss. 292.11 and 292.21 of the statutes would form the basis for determining whether to use our enforcement discretion.

Redevelopment Issues (cont.)

- The applicant would need to submit a request for a written clarification of their liability under HW requirements.
- If the statutory exemption criteria are met, the Lender or LGU would receive WDNR's assurance to use enforcement discretion in determining they are the owner/operator.

Redevelopment Issues (cont.)

- In order to receive assurance from WDNR that enforcement discretion will be used, LGU's typically must:
 1. Restrict access,
 2. Take action to prevent additional releases,
 3. Manage any containerized HW properly.

Redevelopment Issues (cont.)

- In order to receive assurance from WDNR that enforcement discretion will be used, Lenders typically must:
 1. Conduct an environmental assessment, if they take title/possession of the property,
 2. Make a good faith effort to sell the property.
 3. Provide WDNR access to the property.